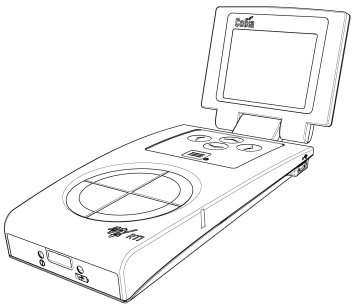
User Manual

Cobia Flex R/F

English - v2014.3A



RTI

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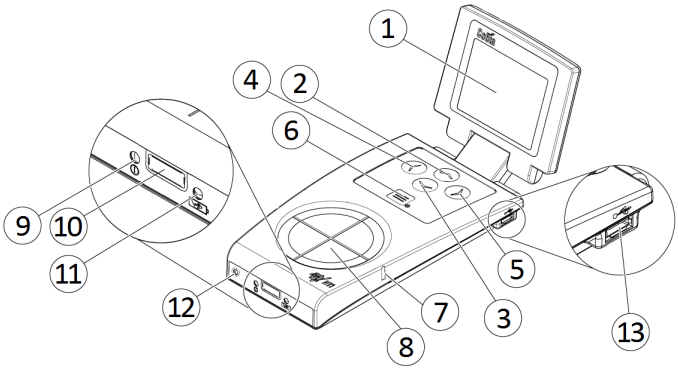
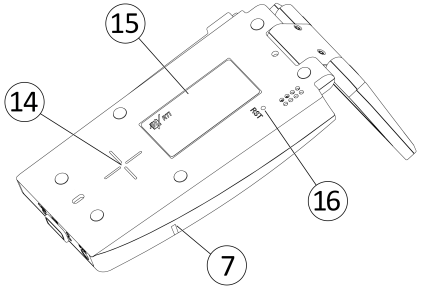
1 Product Overview



TOP VIEW

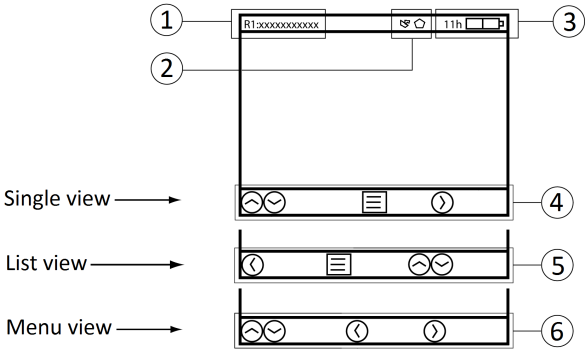


BOTTOM VIEW

#	Name	Description
1	Display	Cobia display. See section *Screen Description* 6
2	Up arrow button	Used to move up in the user interface. See section *Keyboard Operation* 8
3	Down arrow button	Used to move down in the user interface. See section *Keyboard Operation* 8
4	Left arrow button	Used to move left/back in the user interface. See section *Keyboard Operation* 9
5	Right arrow button	Used to move right or make a selection in the user interface. See section *Keyboard Operation* 8
6	Menu and On/Off button	Used to start and power off the Cobia, and display the system menu. See section *Keyboard Operation* 8
7	Positioning marker	Marks the depth of the radiation measurement surface
8	Measurement surface	Circular entrance surface for the measurement sensors
9	Status indicator	Indicates functional status of the Cobia
10	External probe input	Used to attach external measurement probes
11	Battery charging indicator	The orange battery charging indicator is lit when the battery is charging. See section *Battery Charging Details* 17
12	Optional MAS connector	Used to attach invasive MAS cable (selected models). See section *Connecting the MAS Cable* 14
13	Micro-USB connector	Used both to charge and to connect the Cobia to a computer. See sections *Charging the Battery* 9 , *Updating the System* 16, *and Communicating with a PC* 18
14	Measurement center marking	Marks the center position of the radiation measurement on the bottom side
15	Product label	Displays detailed information about the product and model (on the bottom side)
16	Reset hole	Used to do a hardware reset of the Cobia. Marked "RST"(on the bottom side)

1.1 User Interface

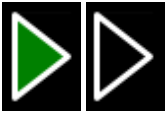
1.1.1 Screen Description



A status field is displayed at the top of the screen. The left side of the field shows the Radiation or Measurement Quality Code and a description of the active range (1).The middle part of the field displays icons for when power is supplied and when an external probe and/or internal MAS cable is attached as well as warning symbols for when any settings are set to non-standard values (2). The right side of the field displays an icon for external power supply and an indicator for the battery level (3).
At the bottom of the screen a simple user guide is displayed. For each view, the buttons that are functional in this view are shown, together with a short text describing the function of the buttons (4-6).

Single view
In single view, only one active parameter is displayed, represented by the value and its unit. Each unit is shown by a specific color. Pressing the up / down arrow buttons will change the active parameter.
When using the internal tube current socket (MAS) or an external detector (EXT) an indicator will appear in the leftmost side of the unit field (not shown).

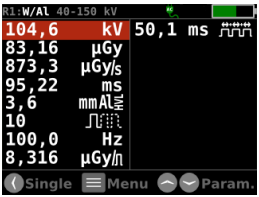
Located to the left of the value, two symbols may be visible:



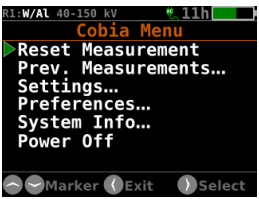
1. A play symbol (triangle) is visible during the measurement. It is filled (green) during the radiation detection, and will then stay contoured while the Cobia accepts continued measurement during Restart Delay.

1B. When using the optional parameter cycling, a rotating indicator will appear just above the play symbol.

2. A pulse indicator is shown below the play symbol. This indicator is turned on when pulses are detected, resulting in display of additional pulse parameters.

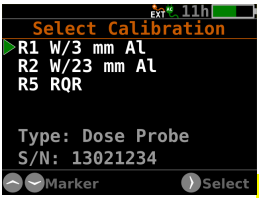


List view
In the List view, all the available parameters are shown simultaneously. The active parameter (displayed in Single view) is indicated in color.
If a measurement is started when the Cobia is in List view, the display will switch to Single view during the measurement and then return to List view after completion. Parameters from MAS or EXT are marked accordingly.
Note! The available parameters may vary depending on the model of the Cobia. The example picture shows a pulsed measurement with Cobia Flex R/F kV & Dose.



Main Menu view
The Menu view displays a set of available functions, selected by pressing the right arrow button. *Reset Measurement* zeroes and resets the meaurement. *Prev. Measurements* recalls the results of earlier measurements. *Settings* is for viewing and modifying the measurement settings. *Preferences* is for

viewing and adjusting personal preferences. Any setting change that can affect the measurement results will be shown in the status field (top of screen). *System Info* gives detailed information about the Cobia, needed during support. *Power Off* turns the Cobia off. When using an external detector or probe, there will be an extra menu item, *Ext.Detector*, that displays detector information and settings as described below.



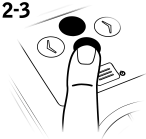
Select External Detector Calibration
When an external detector containing more than one calibration is connected to the Cobia, a selection screen will be shown (left).
For later calibration changes, the selection screen is also available on the Main menu.

1.1.2 Keyboard Operation

1

Menu and On/Off button
If Power = Off: Press once to start the Cobia
If Power = On: Press once to display the menu. Press and hold to switch off the Cobia
In Menu: Closes the menu

2-3



Up and Down arrow buttons
In Single view: Changes the active parameter shown.
In List view: Changes the highlighted (active) parameter
In Menu: Moves the marker

4

Right arrow button
In Single view: Switches the display to List view
In Menu: Activates the marked menu item
In Setting or Preferences menus: Changes the set value (displayed in yellow) or activates the menu item

5

Left arrow button
In List view: Switches the display back to Single view
In Menu: switches the display back to the previous menu or screen

2 Getting Started

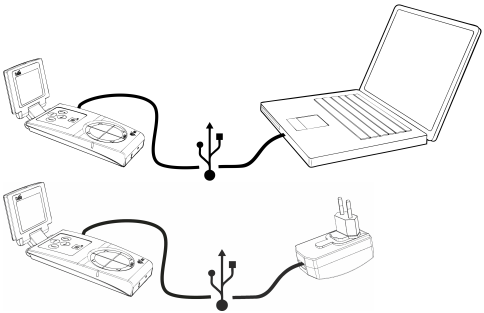
2.1 Before Starting the Cobia for the First Time

Before using the Cobia for the first time, the unit has to be charged for 16 hours. See *Charging the Battery* 9 .

2.2 Charging the Battery

The battery can be charged in two ways:

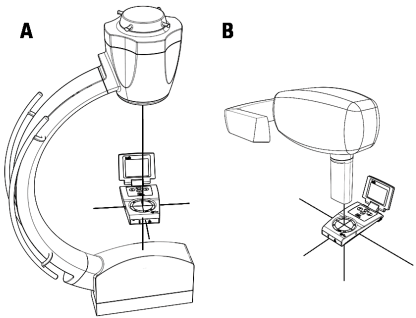
- Via the USB cable connected to a PC. The charging is not disturbed by communication between the PC and the Cobia.
- Via the USB cable connected to the included external charger.



3 Performing a Measurement

3.1 Measuring with the Internal Detector

The pictures below show how to position the Cobia in different types of X-ray units.



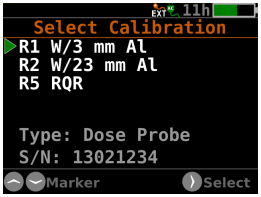
A = Radiography X-ray unit B = Dental X-ray unit

1. Start the X-ray unit.
2. Prepare the X-ray unit for test of desired settings.
3. Start the Cobia.
4. Place the Cobia under the X-ray source at a clinically relevant distance (typically 50 - 100 cm from the source).
5. Make sure that the radiation field covers (at least) the entire Cobia detector surface.
6. Start an exposure.
7. When the measurement is over, the recorded values are by default cycled on the Cobia display. Press the Right arrow button to go to the List view for an overview.
8. Compare the parameters displayed by the Cobia with the test settings for the X-ray unit.
9. Record the results.
10. To repeat, adjust settings and start over from Step 6.

3.2 Measuring with an External Detector

The description below describes how to use an external detector with the Cobia.

1. Start the X-ray unit and Start the Cobia.
2. Set up the external detector unit. For an external dose probe, place the detector at a clinically relevant distance (typically 50 - 100 cm from the source), as described by the manual of the detector.
3. Attach the external detector to the Cobia.
4. If needed, select among the available calibrations (shown below).



5. Adjust the X-ray unit to the desired settings.
6. Start an exposure (or other signal).
7. When the measurement is over, the recorded values are by default cycled on the Cobia display. Press the Right arrow button to go to the List view. All measurement resulting from the external input is marked with an EXT symbol.
8. Record the results.
9. To repeat, start over from Step 5.

3.3 Measuring with a Light Probe

In-depth instructions on using a Light Probe are found in the separate Light Probe manual.

Attach the light probe monitor adapter (picture below, left) for measuring the luminance of a monitor or light box, or the lux adapter (below right) for measuring illuminance (ambient light).

Position the probe in the desired location and read the result.

When using the luminance adapter, the recorded value is automatically saved to the log function. For illuminance measurements, the down arrow button has to be pressed for a value to be saved to the log.

Please note that there is no need to perform a reset before using the Light probe.

More information is available in the guide for *Measuring with an External Detector* 11 .

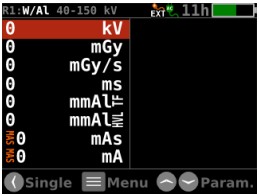
3.4 Measuring with the Optional Internal MAS

The description below describes how to use the optional internal MAS cable with the Cobia Flex R/F + MAS model.

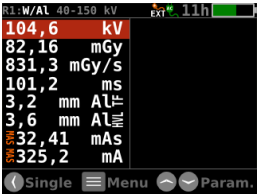
CAUTION!

Users of Invasive mAs meters must be aware of the potential damage to generators and electrical human hazards in the case of improper connection or failure of any part of the meter circuit. The Cobia MAS is intended for use only by those skilled in the calibration and repair of X-ray machines. Please read the section *Tube Current Safety Precautions* 15 for more safety rules.

1. Prepare the unit that is to be tested.
2. Connect the Cobia MAS Cable, as described in section *Connecting the MAS Cable* 14.
3. The tube current parameters are added to the List View, as shown below.



4. Start an exposure.
5. When the measurement is over, the recorded values are by default cycled on the Cobia display. Press the Right arrow button to go to the List view. All measurement results from the internal MAS input is marked with a MAS symbol (shown below).

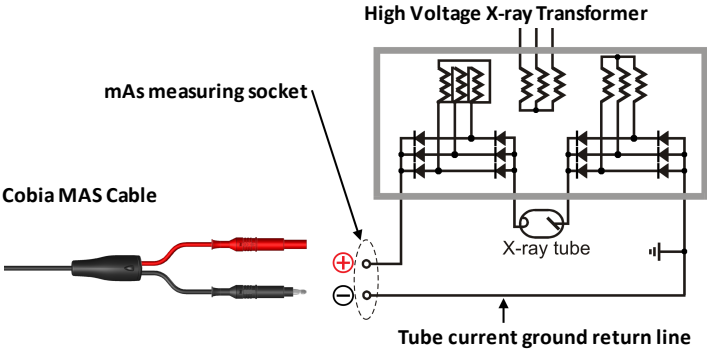


6. Record the results.
7. To repeat, change settings and start over from Step 5.

3.4.1 Connecting the MAS Cable

Please be aware that high voltage may occur if the mAs probe is not properly connected. Read the *Tube Current Safety Precautions* 15 section before starting the measurement.

1. Power down the X-ray generator and wait the recommended time to allow for generator discharge according to generator manufacturer's specifications.
2. Remove the jumper of the mAs measuring socket of the generator.
3. Connect the Cobia MAS Cable to the mAs measuring socket using the included safety cables, observing the polarity (see picture below). If needed, use included adapters.



4. Connect the other end of the Cobia MAS Cable to the MAS input of the Cobia Flex R/F.

Caution!
Do not forget to replace the mAs socket jumper when removing the Cobia MAS Cable.

3.4.2 Tube Current Safety Precautions

Only use the Cobia Internal MAS if you are authorized and skilled to make invasive measurements using the X-ray generator mAs measuring socket.

Please be aware that high voltage may occur on the Cobia Internal MAS if the cable connection to the X-ray generator mAs socket is broken. Always wait approximately one minute after switching off the X-ray generator before connecting or disconnecting the cables between the Cobia Internal MAS and the mAs measuring socket.
Always check that the short circuit path (jumper) normally connected to the mAs measuring socket is reapplied after the use of the Cobia Internal MAS and before the X-ray generator is switched on again.
Important!

- Do NOT connect the Cobia Internal MAS to the filament current circuitry. The Cobia Internal MAS is only intended to measure the tube mA and

mAs.

- Do NOT use the Cobia Internal MAS in contact with a patient.
- Do NOT use Cobia Internal MAS on a circuit with a voltage higher than 90 V DC or 600 V AC.
- Do NOT expose the instrument to direct sunlight, extremes of temperature and humidity, or dew fall.
- Do NOT exceed maximum tube current input (1000 mA).

Note!
The Cobia Internal MAS is intended for service and quality control of diagnostic X-ray equipment. It is not intended for use during diagnostic examinations of patients.

RTI Electronics AB takes no responsibility for misuse of the Cobia Internal MAS or use together with products that the Cobia Internal MAS is not intended for.
RTI Electronics AB assumes no responsibility in case of customers not following these safety precautions.

4 Maintenance

4.1 Scheduled Calibration

RTI recommends that the Cobia is recalibrated every 24 months. Send your Cobia to your local RTI distributor, who will send it to our service department in Mölndal, Sweden, or New Jersey, USA. For contact details, please see the back of this manual or the list of local RTI distributors on the RTI website (www.rti.se).

4.2 Updating the System

Updates can be performed by the user. The system firmware or software is updated by downloading the latest versions from www.rti.se/downloads. Instructions are included in the download or can be found in the reference manual.

4.3 Changing the Battery

The battery is a customized rechargeable battery. That can only be replaced by RTI authorized service centers.

5 Technical Data

5.1 Battery Charging Details

The section *Charging the Battery* [9] describes how the Cobia battery is charged.

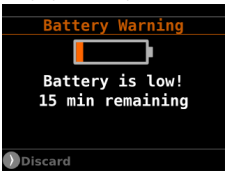
On the front face of the Cobia, there is an orange battery charging indicator, marked . The indicator is lit when the battery is actively charging. It will gradually turn off when the battery is getting closer to fully charged.Charging is possible also when the Cobia is powered off.

Approximate battery charging times:

Capacity	Using power supply	Computer USB, Cobia ON	Computer USB, Cobia OFF
100%	5 h	8.5 h	32 h
90%	3.5 h	7 h	30 h
80%	2.5 h	6 h	27 h
50%	1.5 h	3.5 h	17 h

5.2 Battery Warnings

When the battery is starting to run low, warnings are shown (see below). After the second warning the system can shut down suddenly, due to an empty battery.



5.3 Communicating with a PC

The Cobia Flex R/F includes a user-friendly communication protocol, allowing communication between the Cobia Flex R/F and a computer. The protocol can also be integrated into other software. The protocol is described in detail in the Reference manual.

6 Troubleshooting

If experiencing problems with the Cobia, please go through the following steps before contacting your local RTI distributor or RTI Electronics:

A. Check the RTI website for system updates (www.rti.se).

B. Go through the checklist below.

The Cobia does not start:
If the Cobia does not start, try the following: Connect the charger and retry to start the Cobia. If it does start, the battery was too low to start. If this does not help, try to reset the Cobia as described below.

The Cobia indicates a dose lower than anticipated:
If the dose readings are too low or if the irradiation times for short exposures are too short check that the measurement is performed so that the radiation is perpendicular to the Cobia detector surface. Please also make sure that the entire surface is evenly irradiated.

The Cobia gives "Field Error":
The Cobia detector surface needs to be properly irradiated. Please make sure that the entire surface is irradiated, and that nothing is blocking the radiation.

The external detector gives false readings:
The external detector cable is very sensitive when using certain probe types. Try not to move the detector while attached to the Cobia. To reset false readings, use the *Reset Measurement* on the main menu.

How do I reset the Cobia?

There is a reset hole on the bottom face of the Cobia, marked RST. Insert the end of a paper clip or similar to reset the Cobia.

7 Standards and Compliances

For standards and compliances, see the Reference Manual.

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